THURSDAY, OCTOBER 15, 1903.

EGYPTIAN GEOLOGY.

Topography and Geology of the Eastern Desert of Egypt (Central Portion). By T. Barron, A.R.C.S., F.G.S., and W. F. Hume, D.Sc., A.R.S.M., F.G.S. Geological Survey Report. Pp. viii + 331. (Cairo: National Printing Department, 1902.)

THE work before us is the largest instalment yet published of the results of the explorations which have been carried on with such success by the Egyptian Geological Survey, under the able and energetic direction of Captain Lyons. The district now described was actually surveyed in the years 1897 and 1898, but there appear to have been many delays in arranging for the publication—the time of the authors being taken up by fresh work undertaken in widely distant regions. At the geological congress held in Paris in 1900, however, the two authors of the memoir were permitted to lay some of the chief results obtained from the study of this region before the geologists who had assembled there, and abstracts of their papers have appeared in the *Geological Magazine* for 1901; but the publication of this large and well-illustrated memoir has long been eagerly anticipated, and its appearance will be everywhere welcomed as a most valuable addition to the scientific literature of the district.

The authors must be congratulated upon the excellent use they have made of the vast mass of literature dealing with the geology of the area. In an appendix they have given an admirable abstract of the results obtained by De Rosière, Wilkinson, Schweinfurth, Klunzinger, Walther, and many other travellers, who have by their writings added to our knowledge of this very interesting region. The work of the geological surveyors—a very important one—has been that of correlating and correcting these various sources of information and of supplying, by actual observations in the field, the links necessary to combine the whole into a connected monograph dealing both with the topography and geology of the district.

Like the work carried on in the western territories of North America by the United States Geological Survey, the work in the Egyptian deserts has to be a combination of a geological and a topographical survey. Each working party had to consist of a geologist and a topographer, with a small caravan consisting of eleven Arabs and fifteen camels. The topographical work was done by using a measuring wheel for determining a base line, and working from this with plane-table and theodolite, frequent observations for latitude being made to correct the results; the heights were determined by the aneroid in most instances, but in important cases hypsometer and theodolite determinations were made also. The chief difficulties experienced in the topographical work—apart from those arising from traversing waterless districts—were caused by the mirage and by the frequent presence of great masses of magnetic rock.

While the topographers were engaged in making the map as complete as possible, the geologists were busy examining and recording the interesting features exhibited by the various rock-masses encountered in the different traverses. The district described includes the famous porphyry quarries of Djebel Dokhan, and the ancient upraised coral reefs and their modern representatives on the shores of the Red Sea—some of these reefs being of especial interest, owing to the partial dolomitisation which they have undergone.

The first 115 pages of the volume (which extends to 331 pages) are occupied by an account of the topography of the Red-Sea Hills, and in this part of the work there is much matter of archæological interest in the account of the numerous remains of Roman buildings, and of ancient quarrying and mining works. A very excellent account is also given of the meteorology and of the botany and zoology of the district.

The description of the geology which occupies the second and larger half of the volume deals with the Pleistocene gravels, old beaches, and raised coral reefs, the Pliocene gravels, conglomerates and limestones, the Miocene and Eocene limestones, marls, &c., the Cretaceous limestones, and the "Nubian Sandstone," which in this particular district appears to be in no part older than the Cretaceous. The sedimentary rocks of the district are about 2000 feet in thickness, and cover unconformably the metamorphic and associated igneous rocks. The latter consist of quartz-diorites or grey granites which are younger than and invade the metamorphic rocks, and are themselves intruded into by masses of red granite, with, probably associated, dykes of quartz-felsite and dolerite. These rocks with veins of diabase which intersect them have all been planed down by denudation before the deposition of the sedimentaries. The only later igneous rocks are the andesites which have been intruded into the Eocene limestones, and have produced contact metamorphism in them, and certain igneous gravels and conglomerates which unconformably overlie the sandy limestones of Pliocene age.

The volume is admirably illustrated. Besides the general topographical map of the district and the same geologically coloured, there are five geological maps of areas of special interest. There are also four plates containing coloured panoramas, which give an excellent idea of the relations of the various igneous and other rock masses in this region; and the geological structure of the district is further illustrated by eleven plates of longitudinal sections. The general aspects of this, it must be confessed, rather uninviting region are shown by nine beautiful photogravures by Dr. E. Albert and Co., of Munich, from photographs taken by the authors, while three plates and six photographs are devoted to objects of archæological and general interest.

The important palæontological researches of Beadnell and Andrews have attracted the attention of all geologists to the important work which is being accomplished by the Geological Survey of the Egyptian Government, and the present work will serve to show that every branch of geological science is receiving

due attention from the officers of that survey. It is well known that important explorations have been carried on in other portions of the vast territories now under the rule of the Khedive, and it may be hoped, in the interests of science, that these results may be published with less delay than those we have now been noticing. J. W. J.

EXPERIMENTS ON HUMAN MONSTERS.

Essai sur la Psycho-physiologie des Monstres Humains. By N. Vaschide and Cl. Vurpas. Pp. 294. (Paris: F. R. de Rudeval, n.d.) Price 5 francs.

THE substance of two-thirds of this book has already appeared in various scientific and medical journals. The last ninety-four pages are devoted to the researches of other workers in the same field. The first of the two monsters examined by the authors was an anencephalous male child, which was continuously under observation during the thirty-nine hours of its extra-uterine life. An examination *post mortem* revealed the complete absence of cerebral hemispheres, cerebellum, pons, restiform body, inferior and accessory olives, and pyramidal tract. The monster's apparent lack of taste and smell is devoid of theoretical interest, as the authors omit to mention whether the trigeminal and olfactory nerves were developed. Certainly they failed to find traces of the third and fourth cranial nerves, coincident with the lack of which the infant presented exophthalmos, external squint, dilatation of the pupil, absence of the pupil-reflex, and ptosis. The cerebral hemispheres were replaced by a protruding cystic tumour; throughout the brain and cord the ependyma, neuroglia and ventricles were much hypertrophied, and atrophied degenerated nerve-cells were met with, especially in the cranial region, together with much vascular engorgement and diapedesis. In order to explain the yet healthy state of the retinæ and optic nerves, the authors conclude that the cerebral hemispheres at first developed normally, and were only later affected by "an inflammatory process of an infectious nature," which produced the anencephaly and other abnormalities. But the authors' interpretation of their histological investigations is far from convincing. It is hardly a matter for surprise to find hæmorrhages and wandering leucocytes in the profoundly disturbed nervous system of a cold, moribund, cyanotic creature that breathed only about eight times a minute, and then with a well-marked Cheyne-Stokes rhythm. Moreover, some secondary degeneration may have followed from the complete absence of the pyramidal tract. The authors allude to an insufficiency of myelinisation and to the abnormal proportions between white and grey matter. But these statements, and the rather indifferent plates and illustrations upon which they are founded, would have carried greater conviction, were it certain that the authors (of whom one is an experimental psychologist and the other a hospital resident physician) are perfectly familiar with the corresponding appearances in a healthy newly-born babe.

On pp. 47 and 48 we read:—

"It seems that a class of psychic phenomena, which hitherto have been attributed exclusively to the cerebral hemispheres, such as the special sensibility to touch, pain, and warmth . . . existed in our anencephalous subject independently of the action of the brain."

In point of fact, the reflex movements experimentally obtained by tactual, painful, and thermal stimuli, likewise the abortive attempts of the subject to swallow, its cries and convulsive seizures, one and all are just what might have been expected from a "decerebrate" vertebrate; they are quite void of "psychic" significance in the ordinary meaning of the term, and throw no fresh light on the subject whatever. Surely the presence of these reflex actions, and the integrity of the nerve-trunks, might have led the authors to suspect that nerve-cell degeneration had been neither as extensive nor as intense as they had imagined. But, on the contrary, they incline (p. 76) "to the opinion of certain authors who see in the cell a centre having a function purely trophic and in no way motor," and further urge (p. 75) the impossible view that the infant's (very doubtful) manifestations of spontaneous activity "seem to show that the pyramidal tract has a *rôle* essentially inhibitory instead of dynamogenic." The authors might to their advantage have kept in mind the words of their own preface (p. 16):—

"Nous avons laissé à dessein de côté dans nos travaux et recherches les hypothèses, . . . en nous imposant de ne pas sortir du cadre de l'expérience et des données précises."

The subject of the second far more satisfactory study was a "xiphopage," as the authors call it, in other words, an example of Siamese twins. It was composed of two perfectly formed Chinese boys, fifteen years old, of whom the right was called Liao Toun Chen and the left Liao Sienne Chen. They were united in the region of the xiphoid part of the sternum by a somewhat extensible bridge of tissue which contained cartilage, blood vessels, and very probably a remnant of hepatic substance. This bridge revealed a narrow median anæsthetic zone, surrounded on either side by a hypoæsthetic zone, cutaneous stimulation of which affected only that individual to whom the stimulated area was nearest, but never both individuals. It is, however, difficult to reconcile this interesting observation with another, viz. that if the points of Weber's compasses were separated by 15mm., and the compasses placed astride the median anæsthetic zone, so that one point rested on an area felt by one subject, and the other on an area felt by the other subject, then each child perceived that he was touched in two points. The characteristics of the two children were very different. Liao Toun Chen was mentally and physically more vigorous than his brother. He was more curious and roguish, while Liao Sienne Chen was more attentive and serious. The latter, as we should expect, gave shorter and more trustworthy reaction-times. His sensibility to stimuli was also keener. His body-temperature and his arterial pressure were higher than those of his stronger brother, who in turn breathed with greater rapidity, and had a more frequent pulse. Save in